BATTERY PACK SAFETY DATA SHEET

According to REACH regulation (EC 1907/2006, Art 31) and to OSHA regulation (29 CFR 1910.1200), batteries are ARTICLES with no intended release. As such, they are not covered by legal requirements to generate and supply an SDS or an MSDS.

This Battery Safety Data Sheet is provided solely as an information document for the purpose of assisting our customers.

SECTION 1: IDENTIFICATION OF THE MIXTURE AND OF THE COMPANY

1.1 Product identifier

Battery pack 4S1P BH AA1600, project no. 1882

1.2 Relevant identified uses of the mixture and uses advised against

Identified uses:
The battery pack is made of 4 BH AA1600 cells in the 4S1P configuration protected by electronic components.

Nominal Voltage:	4,8 V
Rated Capacity:	1,6 Ah
Rated Energy:	7,68 Wh

Uses advised against: Not identified.

1.3 Details of the supplier of the safety data sheet:

Supplier:
Register office:
Wamtechnik Sp. z o.o.
7/3 Wilanowska Avenue
02-765 Warszawa
Management Office, Trading Office, Address for correspondence:
Wamtechnik Sp. z o.o.
Techniczna 2
05-500 Piaseczno
Phone.: +48 22 701 26 00
Fax: + 48 22 701 26 00

E- mail address: office@wamtechnik.pl

1.4 Emergency telephone number

Emergency telephone number **in Poland (operating Mo.-Fr. 08:00 – 16:00): +48 22 701 26 00**

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SECTION 2: HAZARDS IDENTIFICATION

Most important hazard and effects: For the battery cell, chemical materials are stored in a hermetically sealed metal case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage. However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by misuse, the gas release vent will be operated. The battery cell case will be breached at the extreme. Hazardous materials may be released. Moreover, if heated strongly by the surrounding fire, acrid or harmful fume may be emitted.

Human health effects: Inhalation:

The electrolyte inhalation affects the respiratory tract membrane and the lungs. Fume may cause a cough, chest pain and dyspnea. Bronchitis and pneumonia may occur. Possibly could be carcinogen.

Skin contact:

The electrolyte skin contact affects the skin seriously and may cause dermatitis.

Eye contact:

The electrolyte leaked from the battery cell is strong alkali. When it goes into an eye, the cornea may be affected and it may lead to blindness.

Ingestion:

The electrolyte ingestion irritates the mouth and the throat seriously results in vomiting, nausea, hematemesis, stomach pains and diarrhea.

Environmental effects: Since a battery cell remains in the environment, do not throw out it into the environment.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Common chemical name / General name	%	CAS NUMBER
Hydrogen Absorbing Alloy	20 - 40	7440-02-0 (Ni)
		7440-48-4 (Co)
		7439-96-5 (Mn)
		7429-90-5 (Al)
Nickel-Cobalt-Zinc Oxide	15 - 25	7440-02-0 (Ni)
		7440-48-4 (Co)
		7440-66-6 (Zn)
Nickel	5 - 15	7440-02-0
Iron	20 - 40	7439-89-6
Copper Foil	1 - 15	7440-50-8
Carbon Black	0 - 1	1333-86-4
Potassium Hydroxide	0 - 15	1310-58-3
Sodium Hydroxide	0 - 15	1310-73-2
Lithium Hydroxide	0 -15	1310-65-2

SECTION 4: FIRST AID MEASURES

Internal cell materials of an opened battery cell

Inhalation: Cover the victim in a blanket, move to the place of fresh air and keep quiet. Seek medical attention immediately. When dyspnea (breathing difficulty) or asphyxia (breath-hold), give artificial respiration immediately.

Skin contact: Remove contaminated clothes and shoes immediately. Wash the adherence or contact region with soap and plenty of water. Seek medical attention immediately.

Eye contact: Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

SECTION 5: FIREFIGHTING MEASURES

Although a battery cell is not flammability, in case of fire, move it to the safe place quickly. The following measures are taken when it cannot be moved.

Suitable extinguishing media: Dry sand, chemical powder fire extinguishing medium
Specific hazards: Acrid or harmful fume is emitted during fire.
Special protective equipment for firefighters: Protective equipment written in Section 8

SECTION 6: ACCIDENTAL RELEASE MEASURES

Internal cell materials, such as electrolyte leaked from battery cell, are carefully dealt with according to the followings.

Personal precautions : Forbid unauthorized person to enter. Remove leaked materials with protective equipment written in Section 8.
Environmental precautions: Do not throw out into the environment.
Method of recovery and neutralization : Dilute the leaked electrolyte with water and neutralize with diluted sulfuric acid. The leaked solid is moved to a container. The leaked place is fully flushed with water.

SECTION 7: HANDLING AND STORAGE

Handling:
Prevention of user exposure: Not necessary under normal use.
Prevention of fire and explosion: Not necessary under normal use.
Precaution for safe handling: Do not damage or remove the external tube.
Specific safe handling advice: Never throw out cells in a fire or expose to high temperatures. Do not soak cells in water and seawater. Do not expose to strong oxidizers. Do not give a strong mechanical shock or throw down. Never disassemble, modify or deform. Do not connect the positive terminal to the negative terminal with electrically conductive material

Storage:
Storage conditions (suitable to be avoided): Avoid direct sunlight, high temperature, high humidity. Store in cool place (temperature: -20 ~ 30 degree C, humidity: from 40 to 80%).
Incompatible products: Conductive materials, water, seawater, strong oxidizers and strong acids
Packing material (recommended, not suitable): Insulative and tear-proof materials are recommended

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

No engineering measure is necessary during normal use.
In case of internal cell materials' leakage, the information below will be useful

Common chemical name / General name		ACGIH(2011)
	TLV-TWA	BEI
Nickel, Nickel Compounds	(As Ni)	-
	Metal : 1.5mg/m3	
	Soluble compounds : 0.1mg/m3	
	Insoluble compounds : 0.2mg/m3	
	(As Co)	In urine : 15 micro g/l
Cobalt Compounds	0.02mg/m3	In blood : 1 micro g/l
	(As Mn)	-
Manganese Compounds	0.2mg/m3	
	(As Al)	-
Aluminum Compounds	1mg/m3 (Flammable powder)	
Zinc oxide	2mg/m3	-
Carbon Black	3mg/m3	-
Potassium Hydroxide	-	-
Sodium Hydroxide	-	-
Lithium Hydroxide	-	-

Respiratory protection:	Protective mask
Hand protection:	Protective gloves
Eye protection:	Protective glasses designed to protect against liquid splashes
Skin and body protection:	Working clothes with long sleeve and long trousers

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	softpack
Weight:	250
Chemical properties:	see Point 3

SECTION 10: STABILITY AND REACTIVITY

Stability :	Stable under normal use
Hazardous reactions occurring under specific	By misuse of a battery cell or the like, oxygen or hydrogen accumulates in the cell and the internal pressure rises. These gases may be emitted through the gas release vent. When fire is near, these gases may take fire. When a battery cell is heated strongly by the surrounding fire, acrid or harmful fume may be emitted.
Conditions to avoid :	Direct sunlight, high temperature and high humidity
Materials to avoid :	Conductive materials, water, seawater, strong oxidizers and strong acids
Hazardous decomposition products:	Acrid or harmful fume is emitted during fire.

SECTION 11: TOXICOLOGICAL INFORMATION

Upon normal use there will be no leaking and nobody can come into contact with toxically ingredients of the battery.

SECTION 12: ECOLOGICAL INFORMATION

Upon normal use there won't be any environmental pollution.

If the battery is unusable, you must recycle it. See Point 13.

SECTION 13: DISPOSAL CONSIDERATIONS

Recommended methods for safe and environmentally preferred disposal :

Product (waste from residues)

Do not throw out a used battery cell. Recycle it through the recycling company.

Contaminated packaging :

Neither a container nor packing is contaminated during normal use. When internal materials leaked from a battery cell contaminates them, dispose them as industrial wastes subject to special control.

SECTION 14: TRANSPORT INFORMATION

Road and railway: ADR / RID 2017 (2)

Classification Information

(1) UN Number:	**3496**	(2) Proper Shipping Name (PSN): (in bold)	**BATTERIES, NICKEL-METAL HYDRIDE**
(3a) Class:	9	(3b) Classification Code:	M11

(4) Packing Group:	-	6) Special Provisions:	-
(7a) Limited quantities:	0	(7b) Excepted quantities:	E0

ADR Tank Information - Not subject to ADR

(13) ADR Tank Special Provisions:	-	(14) Vehicle for Tank Carriage:	-

Special Provisions for Carriage - Not subject to ADR

(16) Packages:	-	(17) Bulk	-
(18) Loading, Unloading and Handling	-	(19) Operation	-

Additional Information

(20) Hazard Identification Number:	-	Emergency Action Code:	2Y
(15) Transport Category:	-	(15) Tunnel Restriction Code:	-

Road carriage in a transport chain including maritime carriage

From ADR 1.1.4.2, packages, containers, portable tanks and tank-containers, which do not entirely meet the requirements for packing, mixed packing, marking, labelling of packages or placarding and orange plate marking, of ADR, but are in conformity with the requirements of the IMDG Code shall be accepted for carriage in a transport chain including maritime carriage subject to the following conditions:

(a) If the packages are not marked and labelled in accordance with ADR, they shall bear markings and danger labels in accordance with the requirements of the IMDG Code;

(b) The requirements of the IMDG Code shall be applicable to mixed packing within a package;

(c) For carriage in a transport chain including maritime carriage, if the containers, portable tanks or tank-containers are not marked and placarded in accordance with ADR Chapter 5.3, they shall be marked and placarded in accordance with Chapter 5.3 of the IMDG Code. In such case, only ADR 5.3.2.1.1 (blank orange plates) is applicable to the marking of the vehicle itself. For empty, uncleaned portable tanks and tank-containers, this requirement shall apply up to and including the subsequent transfer to a cleaning station.

This derogation does not apply in the case of goods classified as dangerous goods in classes 1 to 9 of ADR and considered as non-dangerous goods according to the applicable requirements of the IMDG Code.

Vehicles other than those carrying containers, portable tanks or tank containers, which are not placarded in accordance with the provisions of ADR 5.3.1 but which are marked and placarded in accordance with Chapter 5.3 of the IMDG Code, shall be accepted for carriage in a transport chain including maritime transport provided that the orange-coloured plate marking provisions of ADR 5.3.2 are complied with.

For carriage in a transport chain including maritime carriage, the information required under ADR 5.4.1 and 5.4.2 and under any special provision of ADR Chapter 3.3 may be substituted by the transport document and information required by the IMDG Code provided that any additional information required by ADR is also included.

Sea: IMDG Code Amendment 39-18 (3)

Classification Information

(1) UN Number:	**3496**	(2) Proper Shipping Name (PSN): (in bold)	**BATTERIES, NICKEL-METAL HYDRIDE**
(3) Class or division:	9	(4) Subsidiary Risks:	-
(4) Packing Group:	-	6) Special Provisions:	117 963
(7a) Limited quantities:	0	(7b) Excepted quantities:	E0

Packing Information

(8) Packing instructions:	See SP963	(9) Packing provisions:	-
(10) IBC instructions:	IBC08	(11) IBC provisions:	-
(13) Tank instructions:	-	(14) Tank provisions:	-

Additional Information

(15) Emergency Schedule:	F-A,S-I	Flashpoint:	-
High Consequence:	No	State:	Solid
(16a) Stowage and Handling:		(16b) Segregation	
	Category A.		
	SW1	Protected from sources of heat.	

* Class	1.1/1.2/1.5	1.3/1.6	1.4	2.1	2.2	2.3	3	4.1	4.2	4.3	5.1	5.2	6.1	6.2	7	8	9
Segregation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Segregation Groups

(17) Properties and Observations:

Nickel-metal hydride button cells or nickel-metal hydride cells or batteries packed with or contained in equipment are not subject to the provisions of this Code.

General Stowage Requirements

Cargo Ships - On or under deck. - Passenger Ships - On or under deck. -

Air: IATA 2019 (4)

The product is handled as Non-Dangerous Goods by based on IATA (Special Provision A199) for air shipment

SECTION 15: REGULATORY INFORMATION

(1) UN 3496: Transportation regulations for Nickel-Metal Hydride Battery

(2) ADR / RID 2019: Regulations on the transportation of dangerous goods by road and railway

(3) IMDG-Code 39-18: Regulations on the transportation of dangerous goods by sea.

(4) IATA 2019: Regulations on the transportation of dangerous goods by air.

SECTION 16: OTHER INFORMATION

The information contained in this safety data sheet describes the product exclusively from the safety requirements perspective. The user is responsible for setting up the conditions for safe use of the product and bears a sole responsibility for the consequences of its incorrect use.